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WHEAT GERM HAS HIGH NUTRITIVE VALUE

Wheat germ is one of the richest known sources of vitamin E, and contains some vitamin A. Studies recently carried out in the Bureau of Home Economics have shown that it is also very rich in vitamins B and G and has definite pellagra-preventing value. These findings and the fact that it has an excellent flavor make wheat germ desirable for human consumption. Heretofore, it has been considered a by-product of the milling industry and used almost entirely for animal feeds.

The embryo or germ portion of wheat as it is separated in milling is called wheat-germ meal and represents about 1 percent of the entire grain. In the milling process the germ is flattened and sifted out as a yellowish oily flake. Milling "shorts" contain a large percentage of the germ of the wheat. When untreated wheat germ is stored for any length of time at or above room temperature it becomes rancid and develops a bitter taste. Methods of processing have recently been developed, however, which prevent these undesirable changes and make it possible to market this product. Entire wheat germ put up in one pound packages and products containing added wheat germ are now available. Wheat germ in quantity lots may also be obtained direct from some mills. Unheated wheat germ should not be consumed in large amounts since it may have toxic effects.

The Bureau of Chemistry and Soils has made chemical analyses of six samples of wheat germ. The samples came from mills in various wheat-growing centers and were chosen from a larger number collected by this bureau and the Bureau of Agricultural Economics. These, together with analyses from several other sources, have been summarized (see p. 4) to indicate the average proximate composition of wheat-germ meal.

Recipes Using Wheat Germ

The following recipes using the mill product have been worked out and tested. Since fresh milk is not easily obtained in some of the communities where foods rich in vitamin G are most needed, it is suggested that evaporated milk or dried milk be used if possible. One-fourth of a cup of skim milk powder diluted with one scant cup of water makes a satisfactory substitute for one cup of fresh skim milk. Or one-third cup of whole milk powder with a scant cup of water may be substituted for a cup of whole milk. For convenience, the powder may be mixed with the other dry ingredients and the water added later.

Wheat Germ Biscuit

1 teaspoon salt

5 teaspoons baking powder

2 cups wheat flour

1 cup wheat germ

3 tablespoons fat

7/8 to 1 cup milk

Sift the salt and baking powder with the flour, and stir in the wheat germ. Cut or rub in the fat. Add the milk gradually and mix with a fork to form a soft dough. Place on a floured board and pat or roll lightly to about $\frac{3}{4}$ inch thickness. Cut into small rounds and bake 12 to 15 minutes in a hot oven (400° to 430° F.). Serves 5 to 6.

Wheat Germ Yeast Bread

1 cup milk	1 cake compressed yeast
1-1/2 teaspoons salt	3 cups wheat flour
1 tablespoon sugar	1 cup wheat germ
1 tablespoon fat	

Scald the milk and pour all but a small portion of it over the salt, sugar, and fat. When the remaining milk has cooled to lukewarm, soften the yeast in it and add to the first mixture. Stir the flour and wheat germ together, add gradually to the liquid mixture until a moderately stiff dough is formed, and knead. Let rise until double in bulk. Punch down or knead lightly. When bulk is doubled again, form into a loaf, let rise until again doubled, and bake 35 to 40 minutes in a moderately hot oven ($350^{\circ}\text{F}.$). Makes one loaf.

To increase the food value, when mixing the dough add 2 or 3 tablespoons dried milk mixed to a paste with 2 tablespoons water.

Wheat Germ Spoon Bread

1 cup white corn meal	1-1/2 cups milk
1 cup wheat germ	2 eggs
2 cups boiling water	2 tablespoons fat
1 teaspoon salt	

Stir the corn meal and wheat germ slowly into the boiling salted water, place in a double boiler and cook for 15 minutes. Remove from the heat and add the milk, the well-beaten eggs, and the fat. Mix well, pour into a greased baking dish, bake for 35 minutes in a moderately hot oven ($400^{\circ}\text{F}.$), then increase the temperature to $425^{\circ}\text{F}.$ for 10 minutes to brown. Serves 5 to 6.

Wheat Germ and Corn Meal Bread

1 cup wheat germ	3 teaspoons baking powder
1 cup corn meal	1 egg
1 tablespoon sugar	1-1/2 cups milk
1 teaspoon salt	2 tablespoons melted fat

Mix the dry ingredients together. Beat the egg, add the milk, and stir into the dry mixture. Add the melted fat and beat well. Pour into a well-greased pan and bake about 40 minutes in a hot oven (400° to $425^{\circ}\text{F}.$). Serves 5 to 6.

Variations: Substitute sour milk for the sweet milk, and $3/4$ teaspoon soda for the baking powder. To increase the food value, add 3 or 4 tablespoons dried milk with enough water to make a paste.

Wheat Germ Brown Bread

1 cup wheat germ	1 teaspoon soda
1 cup corn meal	$3/4$ cup molasses or cane sugar syrup
1 cup wheat flour	1 egg
1 teaspoon salt	1-1/4 cups sour milk

Mix the dry ingredients, add the molasses, beaten egg, and sour milk. Beat the mixture well. Pour into small greased tin cans until about three-fourths full. Cover and steam for $3-1/2$ hours. Remove covers and bake the bread $1/2$ hour in a moderate oven (350° to $375^{\circ}\text{F}.$) to dry out. Makes 3 small loaves.

Variations: Use sweet milk instead of sour and substitute 4 teaspoons baking powder for the soda.

Wheat Germ Gingerbread

1-2/3 cups wheat flour	3/4 cup wheat germ
1/2 teaspoon salt	1 cup molasses
2 teaspoons baking powder	1/3 cup butter or other fat
3/4 teaspoon soda	1/2 cup buttermilk
1 teaspoon cinnamon	1 egg
2 teaspoons ginger	2 tablespoons sugar

Sift together the flour, salt, baking powder, soda, and spices, and stir in the wheat germ. Heat the molasses and fat. When cool add the buttermilk, well-beaten egg, and sugar, and combine with the dry ingredients. Then the batter is well mixed, beat for 3 minutes with a wire egg whip, pour into a greased shallow pan or muffin tins, and bake in a moderate oven (350° to 375° F.) about 40 minutes. Serves 5 to 6.

Wheat Germ Drop Cookies

1/2 cup butter or other fat	2 to 2-1/2 cups wheat flour
1 cup sugar	1/2 cup wheat germ
1/4 cup milk	2 teaspoons baking powder
2 eggs	2 teaspoons nutmeg

Cream the fat and add the sugar gradually. Add the milk and beaten eggs, then stir in the dry ingredients and beat well. Drop by teaspoonfuls on a greased baking sheet. Bake for about 12 minutes, the first 5 minutes in a moderate oven (350° F.), then in a slow oven (300° to 325° F.). Makes about 3 dozen cookies.

Wheat Germ Honey Cookies

3/4 cup honey	1/2 teaspoon cloves
1/4 cup butter or other fat	1/2 teaspoon cinnamon
1 egg	2-1/4 cups wheat flour
1/2 teaspoon soda	1 cup wheat germ
1/2 teaspoon salt	1 cup raisins

Heat the honey and mix with the fat. Cool and add the beaten egg. Stir in the dry ingredients and raisins, and beat well. Drop by teaspoonfuls on a greased baking sheet. Bake in a moderate oven (350° F.) for the first few minutes so the cookies will hold shape, then lower the oven heat to about 300° to 325° F., and bake for about 8 minutes longer. Makes about 2 dozen cookies.

The quantity of wheat flour may have to be varied with different consistencies of honey.

Wheat Germ Chocolate Pudding

2/3 cup white corn meal	2 eggs
1/3 cup wheat germ	2 tablespoons butter or other fat
1 teaspoon salt	2 squares unsweetened chocolate, melted
3 cups milk	1 cup sugar
	1 teaspoon vanilla

Stir the corn meal, wheat germ, and salt into the milk, and cook in a double boiler for 5 minutes. Pour this mixture slowly into the well-beaten eggs. Add the fat, melted chocolate, sugar, and vanilla, pour into a greased baking dish, and bake about 35 minutes in a moderately hot oven (about 375° F.). Serves 5 to 6.

WHEAT GERM Proximate composition of wheat germ meal from mills in various wheat-growing areas 1/

Sources Sample	Milled	Comparison of 6 samples, proportion of Bran : Flour	Appearance		Protein (N x 6.25)		Carbohydrates		Total ash	Crude fiber	Fuel value per pound
			%	%	%	%	%	%			
U. S. Dept. of Agr. 1929	1 2 3 4 5 6	Spokane Kansas City Minneapolis Louisville Kansas City Minneapolis	Medium High Medium Low Highest Lowest Medium Low	Highest Medium Low Low Lowest Lowest Medium Low	10.6 10.2 11.0 10.9 11.0 12.0	22.6 24.4 29.6 26.2 31.3 28.9	8.2 8.4 12.6 9.6 10.4 10.8	55.2 52.4 42.7 48.8 42.6 44.2	2.7 3.2 1.8 3.0 2.0 2.3	3.35 4.64 4.14 4.52 4.74 4.14	1746 1736 1826 1753 1765 1767
Av. No.					11.0 (6)	27.2 (6)	10.0 (6)	47.5 (6)	2.5 (6)	4.26 (6)	1764
Av. Others 1/No.					9.6 (11)	30.3 (11)	11.9 (11)	43.6 (11)	2.0 (6)	4.65 (11)	1827
All					10.1 13.9 6.8 No.	29.2 39.6 22.6 (17)	11.2 15.6 8.2 (17)	45.0 55.2 34.6 (17)	2.3 3.2 1.5 (12)	4.51 5.45 3.35 (17)	1804

1/ Original analyses were made by the Bureau of Chemistry and Soils on samples submitted by the Bureau of Home Economics

2/ Including fiber

2/ Published and unpublished analyses from various sources. One or more samples of hand-separated germ may be included



